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# SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE  
OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION  
FOR THE ADVANCEMENT OF SCIENCE.

FRIDAY, JUNE 30, 1905.

THE MASSACHUSETTS INSTITUTE OF  
TECHNOLOGY AND HARVARD  
UNIVERSITY.

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THE proposed affiliation or alliance of the Massachusetts Institute of Technology with Harvard University was, as we have already reported, approved at a meeting of the corporation of the institute on June 9. Thirty-two of the forty-seven members of the corporation were present, and by a vote of 20 to 12 it was agreed to accept the terms of the agreement drawn up by the committee of the two institutions. Before the agreement can become effective the corporation and overseers of Harvard University must take action and several legal questions must be passed upon by the courts. It will be remembered that on May 5 the faculty of the institute adopted by a vote of 56 to 7 the report of the committee adverse to the affiliation. A full account of the report adopted by the faculty and of the minority report, together with an account of the meeting of the alumni on May 4 has been published in a special issue of *The Technology Review*.

In view of the great importance of the proposed merger for university development and technological education we reproduce here: (1) The agreement prepared by President H. S. Pritchett and Professor A. Lawrence Lowell on behalf of the institute and Dr. H. P. Walcott and Charles Francis Adams, 2d, Esq., on behalf of the university, now adopted by the corporation of the institute; (2) the will of the late Gordon McKay in so far as it relates to his bequest to Harvard University,

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and (3) extracts from the report adverse to the alliance adopted by the faculty of the institute and extracts from the minority report.

AGREEMENT BETWEEN HARVARD UNIVERSITY  
AND THE MASSACHUSETTS INSTITUTE  
OF TECHNOLOGY.

Harvard University and the Massachusetts Institute of Technology, being convinced, after a careful consideration of the conditions which affect the work of education in industrial science, that such work can be greatly advanced and enlarged by a cooperation of the two institutions, in order to secure mutual assistance, render possible a larger enterprise, promote economy, avoid duplication and competition, and give to the purpose of donors who have bestowed money in trust for that object a fuller accomplishment, do make this agreement, which shall endure so long as it shall be found to serve, to the satisfaction of both institutions, the objects above declared. But, whereas the carrying out of such agreement will require the employment of the income of the funds which the University holds, or will hereafter hold in trust, and the University feels that faithfulness in the performance of these trusts which it has accepted is its first duty, to which all other considerations must yield, this agreement shall not go into effect until and unless the University shall have applied to the Supreme Judicial Court for instructions and the court shall have made a decree that this agreement may be carried out without violation of its duties as a trustee and in accordance with law and equity.

I.

The organization of the University, the organization of the Institute, and the title of each to its property and funds shall remain unaffected by this agreement, as shall

also the rights and duties of each in investing and managing its funds.

II.

The institution for the combined work of promoting and furnishing education in industrial science, which it is the object of this agreement to establish, shall retain the name of the Massachusetts Institute of Technology; it shall be under the direction of an Executive Committee, and the instruction therein shall be given by a Faculty, which two bodies shall be constituted as herein below provided.

III.

The said Executive Committee shall consist of nine persons, to be designated by the Massachusetts Institute of Technology, of whom two shall be the President of the Corporation of the Institute and the Treasurer of the Institute, and three shall be members of the Corporation of the University.

Subject to the restrictions herein below expressed, the said Executive Committee shall have the general administration and superintendence of all matters concerning said combined work, including the appointment of officers of instruction and government, and of servants, the power to remove any of them, the fixing of their salaries and the prescribing of their duties, the care of buildings, property, and equipment, the appropriation of money put at its disposal under this agreement, the fixing, collecting, and expending of students' fees, and the supervision and direction of the work of the Faculty, these being substantially the powers now conferred on the Executive Committee of the Institute by its by-laws; it being, however, expressly provided that all appropriations from money furnished either by the University or by the Institute, and all proposed appointments or removals of officers whose salaries are to be paid

therefrom, shall be submitted to the Corporation concerned and approved by it before being finally adopted, it being understood that students' fees shall be deemed to be furnished by the Institute, and that no change shall be made in those fees without its approval.

The said Executive Committee shall keep records of its proceedings, and shall make reports to the Corporation of the University and the Corporation of the Institute annually, and at such other times as either Corporation may request.

#### IV.

The President of the Institute for the time being shall be the President of the said Executive Committee, and shall preside at its meetings, when present. His salary, as fixed by the Corporation of the Institute, shall be paid from the funds furnished by the Institute. He shall be the Chairman of the Faculty, shall have the superintendence of the several departments, and shall act as general executive and administrative officer, subject to the direction and control of said Executive Committee. He shall annually make a report to the Corporation of the University and to the Corporation of the Institute. Whenever a person shall vacate the office of President of the Institute, he shall thereupon cease to be a member of the said Executive Committee.

#### V.

The Treasurer of the Massachusetts Institute of Technology shall be *ex officio* the Treasurer of the said Executive Committee. He shall, as Treasurer of the said Executive Committee, have charge of the funds put at the disposal of said committee, shall make such payments as the committee may authorize, shall keep accurate accounts of all money received and expended, and shall make report of his doings annually, or oftener if required, to the said committee,

and to the Corporation of the University and to the Corporation of the Institute.

#### VI.

The Faculty shall consist of all the present professors, associate professors, and assistant professors of the Institute, and all professors, associate professors, and assistant professors of the University who now give courses of instruction leading to degrees in industrial science, and such officers hereafter appointed as said Executive Committee may designate. The present professors, associate professors, and assistant professors of the University as aforesaid shall not be removed nor have their present salaries reduced without the consent of the Corporation of the University.

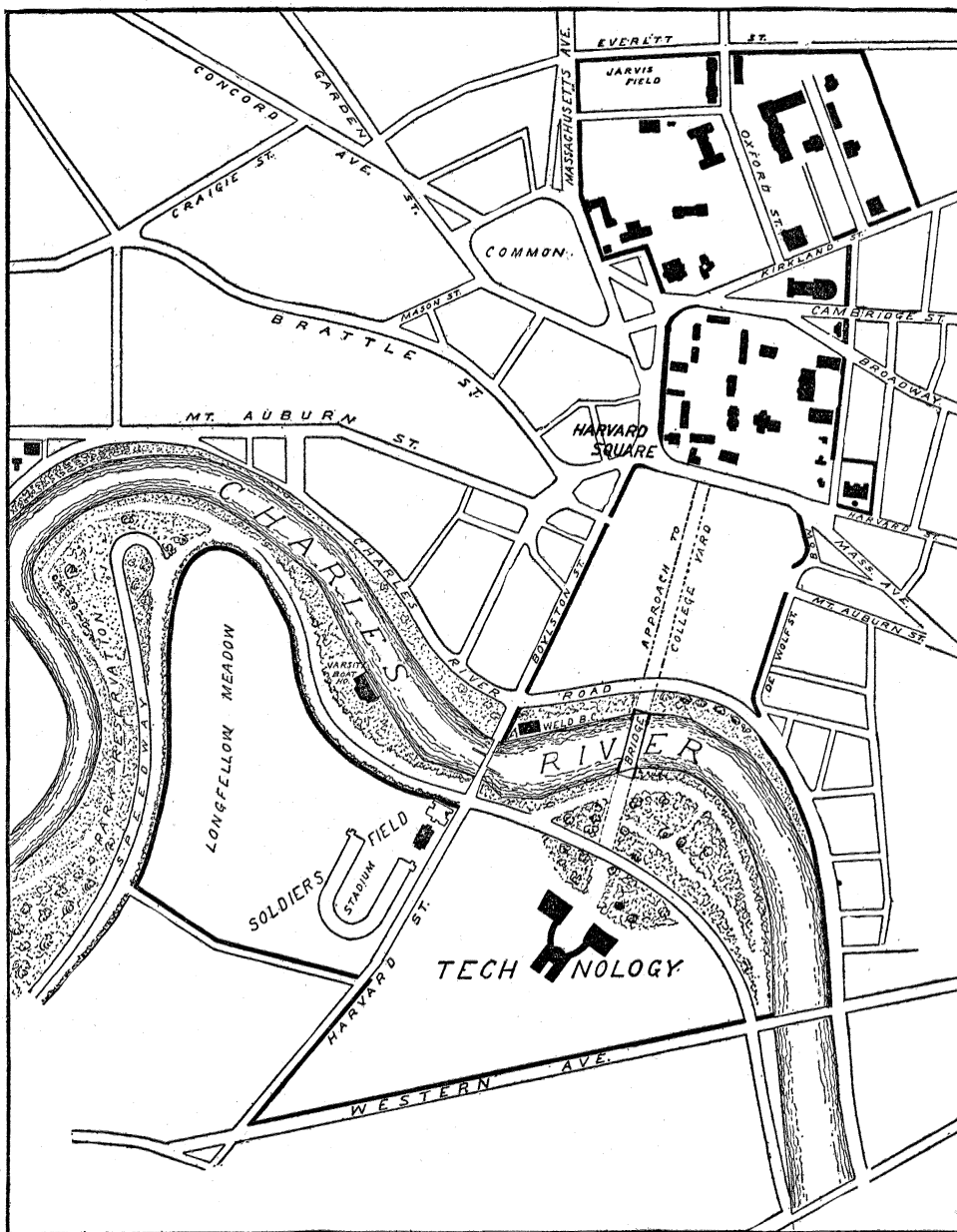
Subject to the supervision and direction of the said Executive Committee the Faculty shall have charge of instruction and discipline.

#### VII.

Subject to the reservations hereinafter set forth the University shall place at the disposal of said Executive Committee, as above provided, the net income of all funds which are now credited on its books to the credit of the Lawrence Scientific School, also the use of all machinery, instruments, and equipment which the University holds, and the income of all property which it may hereafter acquire for the promotion of instruction in industrial science, and also three fifths, but no more, of the net income which may accrue from the bequest and devise of the late Gordon McKay.

#### VIII.

Subject to the reservations herein set forth, the Institute shall place at the disposal of the said Executive Committee the net income of all funds and the use of all property and equipment which the Institute may hold for the promotion of instruction in industrial science, reserving only



Map showing the proposed site of the Massachusetts Institute of Technology and its relation to Harvard University. (From the *Boston Transcript*.)

such amounts and property as it may require to maintain its organization and to carry on such functions as may remain to it independently of the promotion of industrial science.

#### IX.

In so far as money contributed by either Corporation under this agreement may be used by the said Executive Committee for the purchase of equipment or supplies, the

title thereto shall be in the Corporation whose money is appropriated therefor.

#### X.

The site of the institution shall be in Boston on the right bank of the Charles River, as nearly as practicable opposite to Harvard Square, and the Massachusetts Institute of Technology shall there erect, furnish, and equip buildings having the capacity of at least its present buildings. But the Institute shall not be required to proceed with such purchase and construction until it shall have sold a sufficient part of the land which it now owns. Provided, however, that this agreement shall be avoided if at the end of four years from the time when this agreement goes into effect the Institute shall not have purchased said land and proceeded to a substantial extent with such construction.

#### XI.

Within three years after the Massachusetts Institute of Technology begins the construction of such new buildings, if the Institute is then prepared to give in its new location to the students of the Lawrence Scientific School all needed instruction in industrial science, the Lawrence Scientific School shall be discontinued as a separate school of industrial science so long as this agreement remains in force.

#### XII.

The degrees of Bachelor, Master and Doctor in Science, so far as given in industrial science, and all degrees in engineering, together with the requirements of courses of study leading to these degrees, shall be within the province of the Faculty; and these degrees shall be conferred by the Corporations of the University and the Institute, acting separately.

#### XIII.

Male students in the Institute shall have the same privileges as students in Harvard

University in the use of the playgrounds, museums, and libraries of the University.

Under regulations to be made by the two Corporations, and on payment of proper fees, students of the Institute shall be admitted to courses of instruction and the use of laboratories of the University, outside of those pertaining to industrial science, and students of the University to the courses and use of laboratories of the Institute.

#### XIV.

The Corporation and Overseers of the University and the Corporation of the Massachusetts Institute of Technology shall each have full right at all times to inspect the institution, and suggest to the said Executive Committee changes in the methods of management.

#### XV.

The Department of Architecture in the University and in the Institute respectively are not included in this agreement, but remain unaffected hereby.

#### XVI.

It is expressly provided that, as regards the funds and property of the University and of the Institute respectively, this agreement shall be subject to any special terms and requirements upon which such funds and property may be held; and any property or funds which may be held at any time by either Corporation under such terms and restrictions as would prevent the use of them in the precise manner contemplated by this agreement shall, nevertheless, be used by the two Corporations respectively for the support, benefit, or encouragement of the scheme agreed upon, in such manner as may be permissible and in accordance with the trusts upon which they may be held.

#### XVII.

The arrangements established by this agreement may be terminated at any time

either by the President and Fellows of Harvard University or by the Corporation of the Massachusetts Institute of Technology, upon reasonable notice to the other Corporation.

In the event of the termination of this agreement, the Massachusetts Institute of Technology must pay, at such prices and upon such terms as the parties may agree upon, and, if they can not agree thereon, as may be fixed by arbitration (usual arbitration clause), for any buildings or fixtures upon said site, paid for with funds furnished by the University.

#### XVIII.

This agreement shall take effect when finally adopted and approved by the Corporation and the Overseers of the University and the Corporation of the Institute, and when and if a decree of the Supreme Judicial Court, as provided for in the preamble hereof, shall have been obtained.

#### EXTRACT FROM THE WILL AND CODICILS OF THE LATE GORDON MCKAY.

I direct that eighty per cent. of the balance of said net annual income, after paying the annuities (the remaining twenty per cent. being held as a reserved fund to cover any future possible deficiency in the annual income to pay said annuities), shall be safely invested by my trustees from time to time until such accumulations amount to the sum of one million dollars, and then I direct my trustees to pay over said sum of one million dollars to 'the President and Fellows of Harvard College in their corporate capacity,' if said Corporation shall accept the same for the purposes and upon the terms and conditions hereinafter set forth, to be held and applied by them and their successors in said capacity for the purposes and trusts hereinafter declared.

I also direct said trustees to pay to the said President and Fellows (if and after

said sum of one million dollars has been paid over to them, as aforesaid) annually eighty per cent. of the balance of the net income accruing from the remainder of my estate after paying the existing annuities; and upon and after the death of the last surviving annuitant I direct said Trustees to pay over to the said President and Fellows of Harvard College all the residue of my estate, including all unexpended income, all of which said sums I give to the said President and Fellows of Harvard College, provided they accept the same, as aforesaid, strictly upon the trusts and purposes following, namely:—

I direct, if the said Corporation, the President, and Fellows of Harvard College accept said gift, that the sum total of all the property and moneys conveyed by my trustees to the President and Fellows of Harvard College shall be forever known and described in the records of the President and Fellows and on the books of their Treasurer as the Gordon McKay Endowment.

I give the President and Fellows full powers to hold, manage, and protect, improve, sell, invest, and reinvest at their discretion, from time to time, the property in which this Endowment may at any time be invested. I also give the said Corporation authority, in case the principal shall be at any time impaired through misfortune, to accumulate the income of the Endowment, or any part thereof, until the principal shall be made good; but, in order that the principal and income may share in the guaranty or insurance which is derived from the large mass and wide distribution of the University's investments, I prefer that the investments of the Endowment be merged, as soon and as far as in the discretion of the President and Fellows they prudently and equitably may be, with the general investments of the other permanent funds held by the President and Fellows.

The net income of said Endowment shall be used to promote applied science:—

*First.* By maintaining professorships, workshops, laboratories, and collections for any or all of those scientific subjects which have, or may hereafter have, applications useful to man; and

*Second.* By aiding meritorious and needy students in pursuing those subjects.

Inasmuch as a large part of my life has been devoted to the study and invention of machinery, I instruct the President and Fellows to take special care that the great subject of mechanical engineering in all its branches, and in the most comprehensive sense, be thoroughly provided for by my Endowment.

I direct that the President and Fellows be free to provide from the Endowment all grades of instruction in applied science, from the lowest to the highest, and that the instruction provided be kept accessible to pupils who have had no other opportunities of previous education than those which the free public schools afford.

I direct that the salaries attached to the professorships maintained from the Endowment be kept liberal, generation after generation, according to the standards of each successive generation, to the end that these professorships may always be attractive to able men, and that their effect may be to raise, in some judicious measure, the general scale of compensation for the teachers of the University.

I direct that the professors supported from this Endowment be provided with suitable assistance in their several departments by the appointment of instructors of lower grades and of draughtsmen, foremen, mechanics, clerks, or assistants, as occasion may require, my desire being that the professors be free to devote themselves to whatever part of the teaching requires the greatest skill and largest experience and to

the advancement of their several subjects.

I direct that the President and Fellows be free to erect buildings for the purpose of this Endowment, and to purchase sites for the same, but only from the income of the Endowment.

I direct that all the equipment required to illustrate teaching or to give students opportunity to practise, whether instruments, diagrams, tools, machines, or apparatus, be always kept of the best design and quality, so that no antiquated, superseded, or unserviceable implement or machinery shall ever be retained in the lecture-rooms, workshops, or laboratories maintained from the Endowment.

Finally, I request that the name Gordon McKay be permanently attached to the professorships, buildings, and scholarships, or other aids for needy students which may be established, erected, or maintained from the income of this Endowment.

#### EXTRACTS FROM THE MINORITY REPORT IN FAVOR OF THE ALLIANCE.\*

I. If the plan is not adopted, Harvard will be obliged to energetically develop the Lawrence Scientific School as a broad college of applied science. With her resources, reputation, and large body of alumni, and profiting by the lessons of experience, there is no doubt that she can make this school a success. This is abundantly proved by the experience of other universities which have technical schools. This school will be a rival of the Institute in the same community.

II. Competition in business or in education always involves some economic waste. In education it is beneficial only if necessary to keep up the spur to endeavor. The Institute does not require competition with

\* This report was signed by Professors Fay, Jaggard, McKibben, Moore, Swain, Walker, and was supported by President Pritchett.



Harvard for this purpose, and without it will have ample competition with the rapidly growing schools of the Middle and Western States.

III. Of two competing schools, either one will be better than the other or they will be different. If Harvard should build up a great technical school, though ours might on the whole be the better, Harvard would undoubtedly draw to herself many strong students. Every strong student that we lose is a distinct disadvantage to us. We should keep all the strong students, if possible, and let the weak ones go to other schools.

If Harvard should make the Lawrence Scientific School a graduate school, as we understand is desired by its Dean, would not many of the strongest men who come to Boston to study engineering prefer to go where they would be associated solely with more mature men, all having completed their undergraduate courses and devoting themselves entirely to professional work, instead of coming to the Institute, where they would be associated with younger men, and with many special students, in an undergraduate school?

IV. Technical education in this country is scarcely fifty years old. It is not yet on the same plane with instruction in the so-called learned professions. The time has not yet come for making engineering schools generally graduate schools, like so many of those of law and medicine. The Institute and most other engineering schools must remain primarily, for some time at least, undergraduate schools; but the level of industrial education will in the course of time be gradually lifted. The engineer, in order to reach the highest standard, will be expected to be liberally trained and yet to be a specialist. The Institute being one of many, when the university technical schools more generally

reach the standard of the Institute,—and some of them have already fully reached and perhaps in some respects exceeded it,—is there not ground for believing that the young man who desires to qualify himself most completely for the engineering profession will seek the school which has the broadest environment, where he will be brought into relations with students of other professions?

V. The Institute having shown the way, there are now many technical schools where forty years ago there were few. A great majority of these are intimately connected with universities, and the fees at many of them are very low; they are doing excellent work, some as good work as the Institute; they have a much larger body of students; and they are turning out each year a much larger body of graduates than the isolated technical schools. The influence of these university technical schools, industrially and educationally, is increasing relatively in comparison with the isolated technical schools. May not our own influence diminish in the course of time, as the body of alumni of the university technical schools increases in number and in influence? Will we not gain by placing ourselves in the main educational current in the country, by allying ourselves with our most powerful university, especially as we can do so without sacrificing our methods or our control?

VI. Competition from the West will increase. The industrial centre of the country is shifting. When the Institute was established, it was in New England; and even the iron industry and the mining industry were important here. As the years go by, new technical schools will be established in the West, at places like Chicago and Pittsburg, either independent or connected with universities. These schools may well be in closer touch with the indus-

tries of the country than any school in New England would be. When they shall have had time to grow to their full development, what will be the effect upon the Institute of Technology, especially if it is isolated, out of the main current of educational development, and actively competing for support and students with another strong school not three miles distant?

VII. If this agreement is rejected by the Institute Corporation and Harvard energetically develops her technical school, Harvard alumni all over the country—lawyers, bankers, merchants, engineers, men in responsible positions in the great industries—will be enlisted in an active campaign to promote Harvard interests as against Institute interests. By acting together and giving the preference to Harvard graduates, they may at least seriously hamper the growth and retard the development of the Institute. By allying ourselves with Harvard, we should gain the active support of this large and influential body of men instead of their opposition.

VIII. By combination and cooperation instead of competition there is economy in administration; in heads of departments; in libraries and photographs; in museums and collections; in lecture apparatus and similar appliances; in buildings, especially as regards large lecture-rooms not often used; and, to a greater or less extent, in laboratory apparatus.

IX. There is also an economy or an increase of efficiency in combination, with reference to the instructing force. With the same number of men that would be required for two separate institutions a single institution would allow greater specialization in the teaching, permitting the student to come in contact with a larger number of inspiring teachers, or it would enable more than one teacher to teach the same subject, thus stimulating each to do

his best. This stimulus would be greater if the two teachers were in one institution than if they were in two. There might, and probably would, also be an economy in the number of teachers, especially in the purely lecture courses, and, as already stated, in heads of departments.

X. If Harvard energetically develops her technical school, she will probably, in course of time, have more resources available than the Institute, considering her large number of wealthy alumni and their relations to the business world. The McKay will provide "that the salaries attached to the professorships maintained from the endowment be kept liberal, generation after generation, according to the standard of each successive generation, to the end that these professorships may always be attractive to able men, and that their effect may be to raise in some judicious measure the general scale of compensation for teachers of the university." In the course of time, therefore, when the McKay money becomes entirely available, it seems inevitable that Harvard will have a very high standard of salaries for professors in her technical school,—probably much higher than those at the Institute. In this case she could attract to these positions the ablest men, who can not now afford to be teachers because of the inadequate reward. Whether under these conditions the Institute would be the leader in technical education in this community is at least doubtful.

XI. Increase in the number of students, if accompanied by corresponding adaptation or organization of the teaching force, should also conduce to economy and efficiency.

XII. Whether the plan is adopted or not, we can limit our numbers by raising the standard. If increase of numbers is a disadvantage, we should limit them in this

way rather than in any arbitrary way. By adopting the proposed plan, we retain the field, and can get all the strongest students from this community. If there are two schools, Harvard will very likely get as many as we do.

XIII. The addition of the Harvard Faculty to that of the Institute would be a distinct gain. Whether all would harmoniously work together at once is of little consequence. Temporary adjustments might have to be made. With broad-minded cooperation a larger efficiency would result by adding to our body a staff of able teachers with new ideas and without Institute traditions, but animated by ideals and purposes as high as our own. Of all men the teacher is most likely to get into a rut. In-breeding emphasizes this tendency. The influx of a body of new men with other points of view than our own would tend to counteract it.

XIV. If the proposed plan should result in more intimate association between our Faculty and the Faculty of Harvard College, the result would be beneficial.

XV. Institute students are given a narrow training, and would benefit by association with men studying the humanities and the other professions.

XVI. One great lack which Institute men have always felt is college life and college spirit. Many of them come from their homes or boarding places in the morning, attend their classes, and go home at night, seeing little of their fellows, and gaining no experience in the art of getting on with men. Their after-success will probably depend as much upon their ability to deal with men as upon a knowledge of their profession, and their progress may be much retarded by a lack of some qualities which they might gain at the Institute if they could take the time for more intimate association with their classmates.

Moving to a site out of town would give the opportunity for a change in this respect, since it would render possible the introduction of dormitory life.

XVII. The surroundings of many of our Institute students in cheap boarding houses, with poor food and the temptations of a great city about them, are in many cases most unfavorable. We believe the distractions and diversions of such a life, and even the distractions in home life from the presence of friends and relatives and from home chores and duties, are much greater on the average than those which would arise under proper management in the dormitory system. The proposed plan would be an improvement over present conditions, because a larger proportion of students would live in the suburbs, and because dormitories might be established, which is now impracticable.

XVIII. Educational institutions must depend more and more upon gifts from wealthy men. Harvard University and the Institute are in the same community. They must appeal for support to the same class of persons, and in many cases to the same individuals. If the two were working together, the financial results would be better than if the two were working separately and in opposition to each other.

XIX. Rich men who have large sums of money to give away desire to have their gifts expended economically, and, as a rule, they believe that economy results from combination and cooperation rather than from competition. If this agreement should be declined by the Institute, many of them would say that the Institute was unwilling to cooperate, and thereby increase efficiency and economy, while Harvard University was willing to cooperate. This attitude would render them less likely to give to the Institute.

The present plan seems to offer almost

the ideal form of affiliation. The Institute students, together with those now registered in the Lawrence Scientific School, number about 2,100; the Harvard College undergraduates number about 2,000. The technical school, therefore, would be the largest part of the combination, and would be subject to its own Faculty. It would seem most improbable that under these circumstances the smaller body, the great majority of whom are also earnest men, could unfavorably affect the larger and more compact professional body.

XXI. The reciprocal privileges which the plan proposes would very likely be of great value to both institutions, particularly in the case of advanced students.

XXII. By the plan proposed we can get all the benefits of combination and cooperation without relinquishing the power to do anything we are able to do under present conditions.

XXIII. The plan proposed would be of advantage to Harvard for many of the reasons which have already been adduced.

XXIV. The plan proposed would be of benefit to the community by giving it on the whole better advantages for technical education than could be obtained in any other way, and by enabling it to enthusiastically support, financially and morally, a single great institution with which the name of Boston and Massachusetts would be everywhere associated.

#### *Conclusion.*

Weighing the arguments in favor of the plan and those against it, we believe that those in favor decidedly outweigh those against, and that the possibilities are offered us of building up a better and a greater Institute of Technology than has hitherto existed. We believe, moreover, that the plan would be an educational benefit not only to the Institute, but to Harvard

University and to the community. Boston would have one great technical school uniting the forces of two great institutions, and with a united community supporting it. It may be anticipated that it would not be allowed to suffer financially. The Institute would be free, under the plan, to develop in any way which might seem best, and it could do anything under the plan it can do at present, with the added advantage of Harvard's support. We could draw to us the strongest students not only from this community, but from other parts of the country, without suffering any of the disadvantages which would arise, as we believe, from the active competition of a neighboring and powerful school. The best way, and indeed the only way to accomplish in full measure the greatest future for the Institute, would seem to us to lie in securing control of the field of technical education in this community.

#### EXTRACTS FROM THE REPORT ADVERSE TO THE ALLIANCE ADOPTED BY THE FACULTY.

In the list of advantages to the Institute connected with the proposed agreement, removal to the Brighton location has been included by few. President Pritchett does not view it with complete favor, and opinions differ merely as to the degree of disadvantage. Apart from the financial question and the mandatory character of the agreement in this respect, the proposed site has disadvantages connected with the housing and life of the students and the problem of transportation.

At present 44 per cent. of our students live at their own homes, with advantage to themselves and to the Institute. Undoubtedly this has an important conservative effect in determining the atmosphere of the Institute. Removal to a more distant site would greatly decrease this number, and increase the total cost of living

to the student body. It would also introduce the problem of establishing a dormitory system—a problem altogether too important to be settled thus incidentally. A carefully devised dormitory system, it is true, might not seriously menace the professional spirit of our students; but the establishment of such a dormitory system in proximity to Harvard College would involve exceptional difficulties. Upon the question of transportation it may be said that the means now existing and projected, together with the increased facilities that a demand would stimulate, make the location as accessible as might be expected of any place at a similar distance from the center of Boston.

On the other hand, our present site has contributed in no small degree to the distinct individuality of the Institute. This site, in a busy city, is by many regarded as one of our most valuable educational assets, and has great strategic advantages. Students can live in any of the surrounding suburbs, and can in general reach the Institute by one line of steam or electric cars without change, and are within walking distance of the railroad stations; and in like manner they can go from the Institute to engineering and industrial works in a wide circle of suburbs and neighboring towns. The central location attracts to our halls educational and engineering bodies that help to make a professional atmosphere, and assist in advertising the Institute to a scientific constituency of the utmost importance.

*Lack of Definition of the Term 'Industrial Science,' as Bearing upon Instruction and upon Degrees.*

In connection with the proposed alliance, much has been said of the avoidance of educational duplication; but the terms of the agreement as they stand fail to make

it clear that any definite partition has been formulated, either in scientific instruction or in the granting of degrees in science. Nowhere is there a definition of the term 'industrial science,' upon the exact meaning of which these matters depend. The interpretations of the term which have been given to us, in so far as they make matters clear, imply that the intention is to consent to continued duplication in large elementary courses and in some advanced classes, rather than to attempt the unsound and impossible separation between pure and applied science. It has been explained to us that the intention is to continue in the Institute both instruction and the granting of degrees in such branches of pure science as chemistry, physics, geology, and biology. There is reason to believe that the University contemplates the retention of instruction and degree-giving in all these subjects, as well as the retention of elementary instruction in at least some branches of industrial science as College electives. The University also reserves its right to grant any and all degrees, in applied science as well as in pure science; but the agreement implies that Harvard degrees in applied science would hereafter be granted only upon the recommendation of the Faculty of the Institute. The Institute, on the other hand, seems to agree by implication to discontinue the granting of the Ph.D. degree, and of all degrees in other than 'industrial science,' which, as interpreted to us, is to include those branches of pure science, already mentioned, in which degrees are at present granted by the Institute. If, as would appear, the wording of Section XII. constitutes an abdication on the part of the Institute of the right to grant any degrees other than those specified, why should such an abdication be permissible on the part of the Institute when, as we are informed,

the lawyers doubted whether the University could legally divest itself of a similar right?

*Probability that the Earlier Years of Institute Work would be Absorbed by Harvard College.*

Disaster to the integrity of the Institute's curriculum will, it seems to us, be the logical result of this lack of definition of the term 'industrial science,' when it is taken in connection with the fact that the College gives, and is likely to continue giving, elementary courses in mathematics, and in chemical, physical, and engineering subjects. It will be much more natural for a student intending to get an engineering degree to take his elementary work in the College. That such a result is anticipated by the framers of the agreement would appear from the statement of President Pritchett that the stronger technical schools are to take a forward step by which they will be free from much elementary work.

Two special causes are likely to contribute largely to this result. The first is that the tuition fee at Harvard is \$100 less than that of the Institute. Even if the fees were to be equalized, at a serious financial loss to the Institute, there yet remains the second fact that participation in University athletics is open only to students enrolled at Harvard. Boys who are intending ultimately to become engineers, but who are also ambitious of athletic distinction, or even those who desire the real use rather than the partial privilege of the Harvard playgrounds, would be likely to take their elementary work in the College rather than in the Institute. Under existing conditions many parents prefer the professional atmosphere to the academic, and send their sons to the Institute rather for that reason than because they

have any particular engineering career definitely planned for them. It can hardly be expected that this patronage would continue under the altered conditions now proposed.

Yet the most serious effect upon our curriculum, in consequence of such a change of methods, would be the loss of that absolute control over our instruction which we consider essential to the maintenance of our standards. If we turn over our elementary scientific work to another faculty, whose educational purposes and methods are essentially different from ours, we make impossible that close coordination of studies which we consider a prerequisite of successful technological education. Courses of elementary instruction, actually conducted by the Institute, not only give us a rule of comparison between the scientific preparation that is offered by students coming from other institutions and that which we desire and can insist upon, but they insure an advantageous uniformity of training to the great bulk of our students in those scientific studies which are the fundamentals of all technological education. We do not view any prospect of their abandonment with favor.

*Sacrifice of Control.*

A further disadvantage of the proposed agreement is the modification that it makes in the present method of government of the Institute. A new Executive Committee is created, of which at least three members out of nine shall be members of the Corporation of the University. It is our opinion that under this arrangement the 'organization, control, and traditions' of the Massachusetts Institute of Technology would not be so safeguarded as to inspire that confidence in the preservation of its individuality and in the continuance of its educational autonomy which we re-

gard as absolutely essential to the well-being of the Institute and to the efficiency of its work. \* \* \*

#### *The Department of Architecture.*

A thoroughly objectionable section of the agreement is that which excludes the Department of Architecture from its provisions, leaving the future of one of the original and one of the most brilliantly successful departments of the Institute wholly unsettled and problematical. \* \* \*

#### *Loss of Alumni Interest and Support.*

Another disadvantage of the alliance is the danger that the interest and support of the graduates of the Institute will be sacrificed. An important element in the organic growth of an educational institution is a strong, well-organized association of its alumni, the men who can best appreciate the advantages and needs of the institution and who know the places where it can be strengthened. The Institute has such an Alumni Association, with local branches in all parts of the United States, and with a compact subsidiary organization in the form of an Association of Class Secretaries which has proved itself to be useful and efficient, and which promises to grow in importance. The alumni have shown a deep and enthusiastic loyalty, which has taken a practical form in subscription for the William Barton Rogers Scholarship Fund, the Walker Memorial Building, and, more recently and generously, for the Technology Fund. If the proposed alliance is accomplished, the interest of the alumni is sure to diminish with their diminished responsibility for the maintenance of the Institute, and may be altogether alienated. The loyalty of future graduates would at best be a divided sentiment.

#### *Conclusion.*

An institution which has passed beyond its formative period has a right, as a man has, to its own character and individuality. It has earned the right to grow and change along its own lines, and not to be violently wrenched out of them and made over, under new and untried influences, into something different from itself. Such a course might be justifiable as a desperate expedient in the case of a demoralized and decaying school. But the Institute is in no sense a decaying institution. While making no claim to perfection, it desires nothing so earnestly as a fuller and richer though not necessarily a larger growth.

In point of numbers, however, the Institute, despite a steady increase in its requirements for admission and an exceptionally high tuition fee, is more than holding its own, not only in Massachusetts, but throughout New England, and not only in New England but throughout the United States. Our defects—and no one is more conscious of them or more desirous to amend them than is the Faculty—are in part consequences of growth and of success. In part, however, they are inevitable defects of the qualities which have made us what we are. The lack of academic leisure and of monumental college surroundings, and the absence of a great part of the social and athletic life of the typical American college,—such losses are a necessary price which we and our students pay for the spirit of professional study, of business-like regularity, and of scientific accuracy. In the training of engineers we believe that these qualities are worth vastly more than the desirable things which we sacrifice in order to obtain them. While continuing to insist upon these qualities, we shall be glad, so far as we can safely do so, to diminish their defects. But we believe that we can best accomplish this by

remaining free to deal with the problem by methods under our own control. With that high regard for the spirit of university life to be expected from a body of men more than half of whom, as is the case with this Faculty, have received their training from colleges and universities, rather than exclusively from technological schools, we are nevertheless firmly convinced that the effect of direct contact and intermingling of our student body with the dormitory, social, and athletic life of college undergraduates, under the conditions obtaining in this case, would be more harmful than beneficial, and that it would be little less than totally destructive of the established character and atmosphere of the Institute.

A successful and valuable school quite different from ours might no doubt be developed under university conditions, but that would much better be done independently, from such beginnings as already exist, rather than upon the basis of our reputation and at the cost of our individuality. With institutions, as with men, character is a thing which may be undermined and destroyed, but which can not be bought or sold or transferred. The success of the Institute thus far has surely not been due to its wealth, to its superior equipment, or to large salaries paid to its instructing staff. Its success has been and still is a success mainly of character and morale; and it is precisely these vital qualities which the Faculty believes would be destroyed by the changes called for under the terms of this proposed agreement. For it is not merely proposed to remove the Institute to a new site, but to graft it upon another institution.

Very grave questions of policy would at once confront the new Executive Committee in the problems arising from removal and from the establishment of an entirely new type of life among our students, and

from the adjustment of working relations with the University. The controversies and differences within the Committee to which these questions would give rise, and ought to give rise, might under this agreement lead at any time to one of two things:— the rupture of the agreement, or the transfer to the University of a complete control over the working Institute by the election of a majority instead of a minority of the joint Executive Committee from the membership of the University Corporation. The adoption of this agreement would therefore plunge the Institute at once into a condition of uncertainty concerning the preservation of its individuality and control,—an uncertainty probably more prejudicial to its organic development than an immediate and entire surrender of control would be. Even the full assent of the Institute to the proposed agreement would not make it certain that the project is to be carried out. It would have still to receive the sanction of the University, the ratification of the Overseers, and to await indefinitely various legal proceedings and decisions. All these contemplated delays and uncertainties would be further augmented by such other contingencies and delays as must necessarily arise in carrying out so vast and complex an undertaking. This period of uncertainty, extending inevitably over five or six years, would be most prejudicial to the educational work and to the educational prestige of the Institute.

In closing, the Faculty is glad, in accordance with a request made by the President, to take this opportunity to state that it fully believes in the possibility of co-operation in effort between Harvard University and the Institute, and trusts that this may be secured in the future to as great an extent as practicable. There are necessarily limitations to such cooperation,



but we are convinced that it is possible, by consultation and conference, to secure a cooperation thus limited which will prove beneficial to industrial education in general, as well as to the particular work of both institutions. By the more frequent interchange of instructors, by allowing to the advanced students of each institution such privileges of instruction in the other as may be practicable, by the common use of valuable apparatus, by the participation in University and Institute seminars of instructors and students of both institutions, by giving advanced courses of lectures to the combined classes of both institutions; perhaps by mutual agreement from time to time to relegate certain branches of instruction to one of the two; by carrying out together advanced engineering researches and tests,—by these, and by various other ways that will suggest themselves, much may be accomplished in harmonious effort which should be highly beneficial to both the University and the Institute. This development, however, must be a growth. It can not be forced, as the proposed agreement would attempt to force it, for it is in the nature of continuous experiment, presenting problems for the solution of which no data exist.

#### SCIENTIFIC BOOKS.

*Madreporaria*, Parts III. and IV. By J. STANLEY GARDINER, M.A., etc. (From 'The Fauna and Geography of the Maldives and Laccadive Archipelagoes,' Vol. II., Supplement I., pp. 933-957, pls. LXXXIX-XCIII.)

The first installment of Mr. Gardiner's report on the *Madreporaria* from the Maldives and Laccadive Archipelagoes has already been reviewed in the columns of this journal.\* The second installment, which has just been received, contains an account of the *Fungida* and *Turbinolidæ*.

\* Vol. XX., No. 511, pp. 503-505, October 14, 1904.

III. *Fungida*.—548 specimens, besides a number of young forms and fragments, were obtained. These are divided into 27 species and 2 varieties, representing 15 genera; against 24 species and 9 genera reported by Klunzinger from the Red Sea, and 15 species and 7 genera found by the author in the Pacific.

The following is a list of the genera with the number of species referred to each, and the names of the forms considered new: *Psammoseris*, 1; *Siderastrea*, 4, *S. maldivensis*, nov.; *Agaricia*, 1, *A. ponderosa*, nov., + var. *minikoiensis*, nov.; *Fungia*, 3; *Podobacia*, 1; *Halomitra*, 1; *Herpetolitha*, 1, *H. simplex*, nov.; *Cycloseris*, 2; *Diaseris*, 1; *Pavonia*, 1; *Leptoseris*, 3, *L. incrustans*, nov.; *Echinophyllia*, 1; *Pachyseris*, 1; *Coscinaræa*, 2, *C. donnani*, nov.; *Psammocora*, 4; *P. divaricata*, nov.

Mr. Gardiner does not follow von Marenzeller in referring *Stephanoseris* to the synonymy of *Heterocyathus* and *Psammoseris* to that of *Heteropsammia*, but combines *Stephanoseris* and *Psammoseris* under the latter name. He goes further and puts the type species of *Psammoseris* (*P. hemispherica*) in the synonymy of the type species of *Stephanoseris*, which was originally described as *Heterocyathus roussæanus*.

I somewhat doubt the correctness of the generic determination of *Siderastrea clava*, *S. lilacea* and *S. maldivensis*. Mr. Gardiner calls attention to these 'having in their surface parts the thecæ of neighboring calices quite separate from one another, joined together only by costæ, instead of fused together into a single dividing wall.' This difference did not escape his attention.

Mr. Gardiner himself doubts his *Agaricia ponderosa* really being an *Agaricia*. I feel rather confident that it is not an *Agaricia*. The type species of the genus is *A. undata* (Ell. & Sol.) Lamk; the type specimen is in the Hunterian Museum, Glasgow, where I have seen it and Professor J. Graham Kerr has kindly sent me photographs. The genus can be briefly characterized as follows: *Corallum* compound, thin, foliaceous. *Common wall* imperforate, naked, finely striate; no differen-